CLAIMS

What is claimed is:

1. A coaxial probe for testing of planar electric transmission line structures, said probe comprising:

a probe mount comprising a coaxial connector;

a center electrode mounted on said probe mount and electrically connected to a center conductor of said coaxial connector, wherein said center conductor may be placed in contact with a first point on a planar electric transmission line structure to be tested;

an outer electrode mounted on said probe mount and electrically connected to ground, said outer electrode comprising a protrusion to be placed in contact with a second point on the planar electric transmission line structure to be tested; and

a dielectric of non-uniform thickness between said center and said outer electrodes.

2. The probe of claim 1 wherein said probe mount comprises a conductive plate.

3. The probe of claim 2 wherein said dielectric comprises air.

4. The probe of claim 1 wherein said probe mount comprises a printed circuit board.

5. The probe of claim 4 wherein said dielectric comprises said printed circuit board and air.

6. The probe of claim 4 wherein said printed circuit board comprises one or more stubs for tuning electrical characteristics of said probe.

7. The probe of claim 6 wherein said printed circuit board additionally comprises one or more shorting bars located along said one or more stubs.

8. The probe of claim 1 wherein said outer electrode comprises a conductive tube having a non-circular cross-section.

9. The probe of claim 8 wherein said outer electrode has a cross-section selected from the group consisting of oval, square, rectangular, hexagonal, L-shaped, and U-shaped.

10. The probe of claim 8 wherein said protrusion may be placed at any point on a downward-facing surface of said outer electrode without substantially altering impedance characteristics of said probe.

11. The probe of claim 1 wherein a pitch between said center electrode and said protrusion is fixed.

12. The probe of claim 1 wherein said protrusion comprises a 60-degree point.

13. The probe of claim 1 wherein said outer electrode is axially spring-loaded to provide compliance.

14. The probe of claim 1 wherein said connector is spring-loaded to provide compliance.

15. The probe of claim 14 wherein said connector is spring-loaded with a short-throw conductive spring.

16. The probe of claim 1 wherein said probe is handheld during testing of the planar electric transmission line structure.

17. The probe of claim 1 wherein impedance characteristics of said probe substantially match those of a coaxial cable attached to said connector.

18. The probe of claim 1 wherein lumped series resistance is attached to said outer electrode, whereby speed of said probe is increased.

19. The probe of claim 18 wherein said probe comprises a resistor.

20. A differential coaxial probe assembly comprising two probes according to claim 1.

21. A coaxial probe for testing of planar electric transmission line structures, said probe comprising:

a probe mount;

a center electrode mounted on said probe mount, wherein said center conductor may be placed in contact with a first point on a planar electric transmission line structure to be tested; and

an outer electrode of non-circular cross-section mounted on said probe mount.

22. The probe of claim 21 wherein said outer electrode comprises a protrusion to be placed in contact with a second point on the planar electric transmission line structure to be tested.

23. The probe of claim 22 wherein said protrusion may be placed at any point on a downward-facing surface of said outer electrode without substantially altering impedance characteristics of said probe.

24. A differential coaxial probe assembly comprising two probes according to claim 21 with zero or one protrusion on a downward facing surface of each said outer electrode.

25. A differential coaxial probe assembly comprising two probes according to claim 21 with fixed relative positions.

26. A differential coaxial probe assembly comprising two probes according to claim 21 with manually variable relative positions.

27. A differential coaxial probe assembly comprising two probes according to claim 21 with automatically variable relative positions.

28. A coupled line differential probe assembly comprising:

a probe mount;

two center electrodes mounted on said probe mount, wherein both of said center conductors may simultaneously be placed in contact with first and second points on a planar electric transmission line structure to be tested; and

an outer electrode of non-circular cross-section mounted on said probe mount, said outer electrode comprising zero, one or two protrusions to be placed in contact with additional points on the planar electric transmission line structure to be tested.

29. The probe of claim 28 wherein said protrusions may be placed at any point on a downward-facing surface of said outer electrode without substantially altering impedance characteristics of said probe.

30. The probe of claim 28 wherein said outer electrode comprises one protrusion to be placed in contact with a third point on the planar electric transmission line structure to be tested.

31. The probe of claim 28 wherein said outer electrode comprises zero protrusions, where a common ground is not provided between said outer electrode and the planar electric transmission line structure to be tested.

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